NAVISTAR, INC
DEFECT INFORMATION REPORT

TO: Manager
Engine Programs Group (6405J)
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

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DATE : February 3, 2015

The following Defect Information Report is submitted in accordance with 40 CFR §1068.501.

[40 CFR §1068.501(d)(1)] MANUFACTURER CONTACT INFORMATION

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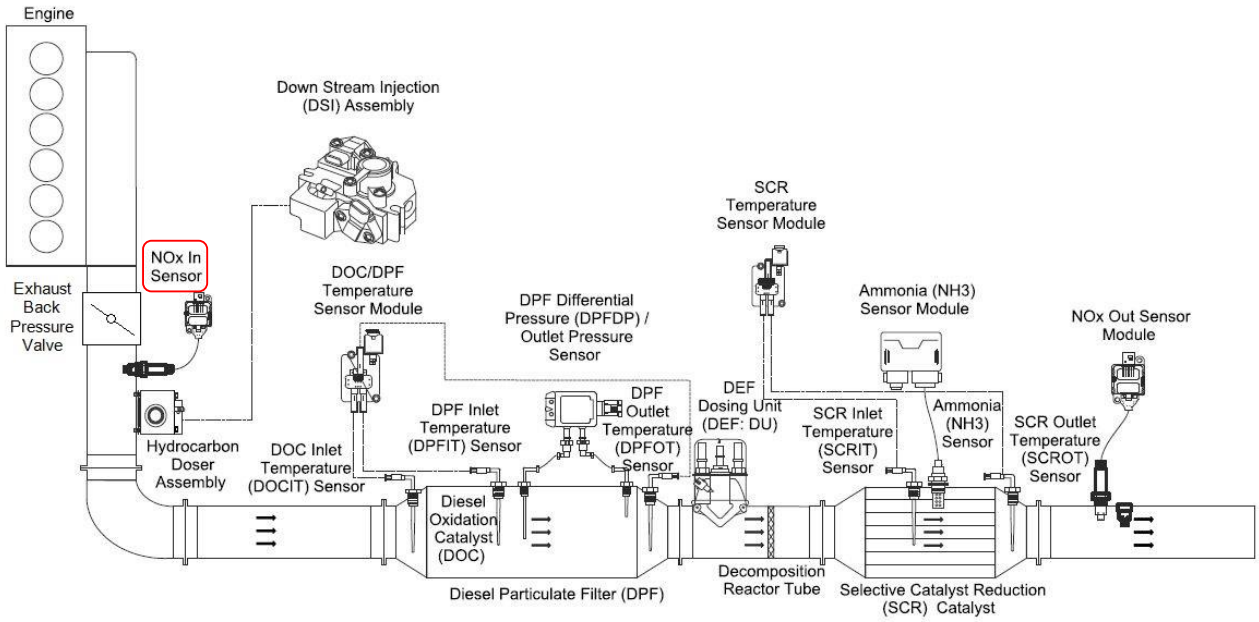
[40 CFR §1068.501(d)(2)] DEFECT DESCRIPTION

This is a defect in the SCR emission control system software, specifically the ACM (aftertreatment control module) software. One component in the SCR control system is the engine out NOx sensor (referred to as the "NOx In" sensor). The DEF dosing system normally operates closed loop based on the input from this sensor and an ammonia sensor. Please reference the diagram below for component locations.

Schematic of aftertreatment sensing and control components



During aftertreatment regeneration or desorption, the exhaust backpressure valve may be activated to increase exhaust temperature. When the backpressure valve is activated, it actually "flutters" as it controls to a backpressure value. The NOx sensor has an internal heating element and control system which maintains a constant 800 F temperature. The "fluttering" of the backpressure valve ultimately causes the "NOx In" sensor to fail due to thermal stresses in the sensor caused by rapid exhaust stream fluctuations. It was determined if the NOx sensor was placed in standby mode (heater off) during activation of the backpressure valve this failure mode was eliminated. Emission control would then be maintained by utilizing a "NOx model" to predict engine out NOx levels.

[40 CFR §1068.501(d)(3)] DESCRIPTION OF VEHICLES/ENGINES AFFECTED

Engine Family Name	Model Year	Engine Model	Engine Plant Ship Dates
ENVXH05700SA	2014	N9 / N10	11/20/14 through 12/4/14

[40 CFR §1068.501(d)(4)] NUMBER OF ENGINES ESTIMATED TO HAVE DEFECT

Family	Number of engines affected	Total Production	Percent of Family Affected
ENVXH05700SA	697	1411	49%

[40 CFR §1068.501(d)(5)] EVALUATION OF EMISSIONS IMPACT

An engine out NOx model had been created for OBD purposes for use if the "NOx In" sensor should fail. The following tests were performed to demonstrate emission compliance when the model results were substituted for sensor measurements during entire test cycles.

No.	Test CELL	Rating	Test ID	EO NOx Source	Test	TP NOx [g/hp-hr]	Composite TP NOx [g/hp-hr]	Comments
1	45	330hp/950lb-ft	DU007586GP017018	Sensor	Cold	0.474	0.178	DEF Dosing based on NOx sensor
2	45	330hp/950lb-ft	DU007586GQ017018	Sensor	Hot	0.129		
3	45	330hp/950lb-ft	DU007586GP017045	Model	Cold	0.481	0.169	DEF Dosing based on NOx model
4	45	330hp/950lb-ft	DU007586GQ017045	Model	Hot	0.117		
5	53	350hp/1150 lb-ft	DU007804DP085005	Sensor	Cold	0.576	0.135	DEF Dosing based on NOx sensor
6	53	350hp/1150 lb-ft	DU007804DQ085005	Sensor	Hot	0.062		
7	53	350hp/1150 lb-ft	DU007804DP084025	Model	Cold	0.489	0.115	DEF Dosing based on NOx model
8	53	350hp/1150 lb-ft	DU007804DQ084025	Model	Hot	0.053		
9	53	350hp/1150 lb-ft	DU007804DM085007	Sensor	RMC	0.044		DEF Dosing based on NOx sensor
10	53	350hp/1150 lb-ft	DU007804DM084029	Model	RMC	0.088		DEF Dosing based on NOx model

EO = engine out TP = tailpipe

In all cases emission control was maintained.

[40 CFR §1068.501 (d)(6)] ANTICIPATED MANUFACTURER FOLLOW-UP

Navistar ceased production of affected engines when this issue was discovered. A running change was filed incorporating this software fix into the ACM for engines subsequently produced. Navistar will conduct a voluntary recall to re-flash the 697 engines built before the running change.

SIGNED: Dave Polivka
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